

REPORT ON ELECTRICAL EQUIPMENT.

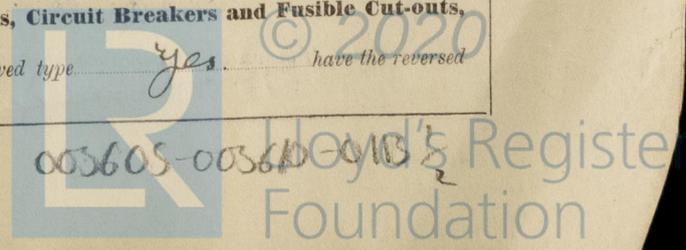
(OTHER THAN FOR THE PROPULSION OF THE VESSEL)

NOV 14 1940

Received at London Office

Date of writing Report 7th Nov^r 1940. When handed in at Local Office 7th Nov^r 1940. Port of Dundee
 No. in Survey held at Dundee. Date, First Survey 17th Sept^r Last Survey 2nd Nov^r 1940
 Reg. Book. 90209 on the s/s "TWICKENHAM" (Number of Visits... (2).....)
 Tons { Gross 4462.
 Net 2663.
 Built at Dundee By whom built Caledon S. B. & Co Ld Yard No. 385 When built 1940
 Owners Britain S.S. Co Ld Port belonging to London
 Electric Light Installation fitted by Jelford Gries Mackay & Co Ld Contract No. ✓ When fitted 1940
 Is the Vessel fitted for carrying Petroleum in bulk No.

System of Distribution Two Wise
Pressure of supply for Lighting 110 volts, **Heating** ✓ volts, **Power** 110 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 ✓, 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 ✓
 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 Main Engine Room. Starboard, 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 No woodwork near, 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 In proximity of Generators.
 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 No woodwork near, are they constructed wholly of durable, non-ignitable non-absorbent materials yes. Sindanyo, 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 Double Pole Switch + fuses for Generator + 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 one ammeters one 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 **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



current protection devices been tested under working conditions **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 **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 *Lead covered*.

Support and Protection of Cables, state how the cables are supported and protected *Cable trays secured to structure*.

If cables are run in wood casings, are the casings and caps secured by screws are the cap screws of brass are the cables run in separate grooves . 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 *None*.

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 *Metal sheath of cables are efficiently bonded by means of clips*.

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 *None*.

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 *None*.

are any fittings placed in spaces where inflammable or explosive dust or gases are liable to be present, if so, how are they protected *None*.

how are the cables led

where are the controlling switches situated

are all fittings suitably ventilated 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 are air heaters constructed and fitted as per Rule .

Searchlight Lamps, No. of whether fixed or portable are their fittings as per Rule .

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*. 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 *No woodwork near*.

have machines of over 100 BHP been inspected by the Surveyors during manufacture and testing **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 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		Insulated with	HOW PROTECTED.
		Kilowatts.	Volts.	Ampères.	Revs. per Min.		Fuel Used.	Flash Point of Fuel.		
MAIN	1	15	110	136	500	Enclosed Steam Engine				
AUXILIARY										
EMERGENCY	1	15	for D.S. purposes only							
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	.15	37	.072	136	152	40 ft.	V.I.R.	Steel Tube	
EQUALISER CONNECTIONS										
AUXILIARY GENERATOR										
EMERGENCY GENERATOR										
ROTARY TRANSFORMER MOTOR GENERATOR										
ENGINE ROOM	1	.0045	7	.029	16	18	20 ft.	V.I.R.	L.C.A. & B.	
BOILER ROOM										
AUXILIARY SWITCHBOARDS										
Saloon & Deck	1	.0225	7	.064	39	46	315 ft.	V.I.R.	L.C.A. & B.	
Midships & aft	1	.007	7	.036	19	24	105 "	"	"	
Cargo	1	.04	19	.052	55	64	180 "	"	"	
Shelter Deck	1	.0045	7	.029	13	18	100 "	"	"	
Navigation	1	.007	7	.036	10	24	365 "	"	"	
ACCOMMODATION										
WIRELESS	1	.007	7	.036	10	24	330 ft.	V.I.R.	L.C.A. & B.	
SEARCHLIGHT										
MASTHEAD LIGHT	1	.023	3	.036	4	12	380 "	"	"	
SIDE LIGHTS	1	.002	3	.029	4	8	85 "	"	L.C. & B.	
COMPASS LIGHTS	1	.002	3	.029	2	8	45 "	"	"	
POOP LIGHTS	1	.023	3	.036	4	12	680 "	"	L.C.A. & B.	
CARGO LIGHTS	1	.003	3	.036	4.5	12	55 "	"	"	
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	1	1	.01	7	.044	26	31	60 ft.	V.I.R.	L.C.A. & B.
WORKSHOP MOTOR										
VENTILATING FANS	3	1	.01	7	.044	25	31	140 "	"	"
Refrigerators										

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.

Jelford Green Mackay, Esq.

Electrical Engineers.

Date *7/11/40*

COMPASSES.

Distance between electric generators or motors and standard compass *136 ft.*

Distance between electric generators or motors and steering compass *130 ft.*

The nearest cables to the compasses are as follows:—

A cable carrying *10* Ampères *12* feet from standard compass *5* feet from steering compass.

A cable carrying *2* Ampères *one* feet from standard compass *one* 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

The maximum deviation due to electric currents was found to be *nil* degrees on *all* courses in the case of the standard compass, and *nil* degrees on *all* course in the case of the steering compass.

FOR AND ON BEHALF OF
THE CALEDON SHIPBUILDING & ENGINEERING CO. LTD.

J. H. Rustie

Builder's Signature.

Date *4/Nov/1940*

DIRECTOR.

Is this installation a duplicate of a previous case *yes ✓* If so, state name of vessel *s/s "Tottenham"*

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

This Installation has been efficiently fitted on board; the wiring has been carried out in accordance with the Rules & the approved plans, the materials & workmanship being sound & good.

On completion the installation was tried out under full load & working conditions, & it was found satisfactory in all respects.

*Noted
J.H.
19/11/40.*

Total Capacity of Generators *15* Kilowatts.

The amount of Fee	£ 15 : 0 : 0	When applied for,	<i>8/11/1940.</i>
<i>4/5ths Dues = £ 12-0-0</i>		When received,	<i>3.12.40 R.B.B.</i>
<i>1/5th Gls. = £ 3-0-0</i>			
Traveling Expenses (if any) £			

John Houston
Surveyor to Lloyd's Register of Shipping.

GLASGOW 12 NOV 1940

Committee's Minute

SEE ACCOMPANYING MACHINERY REPORT

Assigned



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Lloyd's Register Foundation

2m.5.34.—Transfer.
The Surveyors are requested not to write on or below the space for Committee's Minute.)