

## REPORT ON ELECTRICAL EQUIPMENT.

(OTHER THAN FOR THE PROPULSION OF THE VESSEL)

MAR -4 '39

Date of writing Report 24<sup>th</sup> Feb., 1939 When handed in at Local Office 3 MAR 1939 Port of Middlesbrough  
 No. in Survey held at Haverton Hill-on-Sea Date, First Survey 2<sup>nd</sup> Dec., 1938 Last Survey 23<sup>rd</sup> Feb., 1939  
 Reg. Book. Suppl. and Sunderland (Number of Visits 4)  
87299 on the M.V. "BRITISH LIBERTY"  
 Built at Haverton Hill-on-Sea By whom built Furness S.B. Co. Ltd. Yard No. 287 When built 1939  
 Owners British Tanker Co. Ltd. Port belonging to London  
 Electric Light Installation fitted by Furness S.B. Co. Ltd. (Elec. Dept.) Contract No. 287 When fitted 1939  
 Is the Vessel fitted for carrying Petroleum in bulk Yes

System of Distribution Double wirePressure of supply for Lighting 110 volts, Heating 110 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 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 30 kw. sets arranged to run in parallel, is an adjustable regulating resistance fitted in series with each shunt field YesHave certificates of test results for machines under 100 kw. been submitted and approved Yes, Certs. furnished Have machines over 100 kw. been inspected by the Surveyors during manufacture and testing None fittedHave certificates for generators under 100 kw. been supplied and approved Manufacturers' test certs. only suppliedAre 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 Engine room forward of main engine, 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 YesEarthing, 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 Engine room on raised platform on forward bulkhead

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 Yesif 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 Yesis 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 YesAre 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 Yesindividual fuses to voltmeter, pilot or earth lamp Yes, are moving parts of switches alive in the "off" position Yes are all screws and nuts securing connections effectively locked Yes are any fuses fitted on the live side of switches YesMain Switchgear, description of switchgear for each generator and each outgoing circuit, and arrangement of equalizer switches D.P. circuit breakers with O.C. and R.C. trips & equalizing contacts on 30 Kw. generator main; D.P. C.W. & D.P. fuses on 8 Kw. generator main; D.P. C.W. & D.P. fuses on outgoing circuits.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 Three ammeters Threevoltage meters — synchronising device for paralleling purposes. For compound machines is the ammeter connected on the opposite pole to equaliser connection YesEarth Testing, state what means are provided at the main switchboard for indicating the state of the insulation of the system E lamps coupled to E 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 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, concentric, or multicore *Single* 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 *—*

Fall of Pressure, state maximum between bus bars and

any point of the installation under maximum load *Less than 5.3 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 *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 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*

Support and Protection of Cables, state how the cables are supported and protected *Yes*

*L.C.B. cables clipped up in machinery spaces in. all machinery & in engine room & running in galley pipes along fore & aft gangway; L.C.B. cables in machinery.*

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 *Yes*

Joints in Cables, state if any, and how made, insulated, and protected *Home 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 *Lead*

Earthing Connections, state what earthing connections are fitted and their respective sectional areas *—*

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 *A 24 volt nickel iron battery and charging board is fitted in the engine room to provide emergency lighting.*

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*

are they ventilated as per Rule *fitted in engine room adjacent to main switchboard.*

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 *Anti-static*

*fittings installed in pumproom and in dangerous spaces* how are the cables led

*be kept covered galvanised pipe work external to pumproom*

where are the controlling switches situated *in the midship accommodation space*

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 *Quantity 100* whether fixed or portable *fixed forward*, 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 *—* and *—*

have machines of over 100 BHP been inspected by the Surveyors during manufacture and testing *Home fitted* have certificates for all motors for

essential services been supplied and approved *Yes, certs. hmu with* 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.	Revs. per Min.		Fuel Used.	Flash Point of Fuel.
MAIN ...	2	30	110	273	550	Single cyl. steam engine	Fuel oil	Above 155°F
AUXILIARY ...	1	8	110	72.8	750	Single cyl. diesel engine		
EMERGENCY ...						Single cyl. steam engine		
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 ...	1	.2	37	.083	273	296	36 steam	V.C.	L.C.A.B.
EQUALISER CONNECTIONS	1	.075	19	.072	—	97	40 diesel	V.I.R.	L.C.A.B.
AUXILIARY GENERATOR...	1	.0225	7	.064	72.8	75		V.C.	L.C.A.B.
EMERGENCY GENERATOR									
ROTARY TRANSFORMER									
ENGINE ROOM...									
BOILER ROOM...	1	.01	7	.044	27	42	20+300	V.C.	L.C.A.B.
AUXILIARY SWITCHBOARDS									
VENT. FANS S.B. FEED:-	1	.04	19	.052	73.7	104	40	V.C.	L.C.A.B.
SUPPLY:- E.R. PORT AFT	1	.0045	7	.029	12.5	18.2	300	V.I.R.	L.C.A.B.
BOAT OK. RET.	1	.0045	7	.029	12.5	18.2	280	V.I.R.	L.C.A.B.
BOAT OK. PORT	1	.0045	7	.029	11.2	18.2	300	V.I.R.	L.C.A.B.
BOAT OK. STD.	1	.0045	7	.029	11.2	18.2	500	V.C.	L.C.A.B.
MID. FANS S.B. FEED:-	1	.0045	7	.029	12.7	18.2	120	V.I.R.	L.C.A.B.
SUPPLY:- BOGE. PORT	1	.0045	7	.029	12.7	18.2	110	V.I.R.	L.C.A.B.
BOGE. STD.	1	.0045	7	.029	2.5	7.8	50	V.I.R.	L.C.A.B.
PANTRY	1	.0045	7	.029	2.5	7.8	200	V.C.	L.C.A.B.
ACCOMMODATION RET ...	1	.04	19	.052	22	104	500	V.C.	L.C.A.B.
MIDSHIP LTH. S.B. FEED:-	1	.12	37	.064	59	210	80	V.C.	L.C.A.B.
SUPPLY:- MIDSHIP PORT O.B.	1	.01	7	.044	25	42	20	V.C.	L.C.A.B.
MIDSHIP STD. O.B.	1	.01	7	.044	25	42	600	V.C.	L.C.A.B.
FORECASTLE	1	.0225	7	.064	9	75		V.C.	L.C.A.B.
NAVIGATION LTH. D.B.	1	.0145	7	.052	7	57	620	V.C.	L.C.A.B.
CHARGING PANEL	1	.0045	7	.029	16	18.2	40	V.I.R.	L.C.A.B.
WIRELESS	1	.01	7	.044	15	42	630	V.C.	L.C.A.B.
SEARCHLIGHT	1	.0225	7	.064	—	75	1100	V.C.	L.C.A.B.
MASTHEAD LIGHT	1	.003	3	.036	.36	12.0	400	V.I.R.	L.C.A.B.
SIDE LIGHTS	1	.003	3	.029	.36	7.8	120	V.I.R.	L.C.A.B.
COMPASS LIGHTS	1	.002	3	.029	.14	7.8	80	V.I.R.	L.C.A.B.
STEER LIGHTS	1	.003	3	.036	.36	12.0	800	V.I.R.	L.C.A.B.
CARGO LIGHTS									
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										
FORCED DRAUGHT FAN	1	1	.01	7	.044	39	42	200	V.C.	L.C.A.B.
WINCHES, AFT										
ENGINE RM. CRANE	1	1	.01	7	.044	24	42	110	V.C.	L.C.A.B.
STEERING GEAR—										
(a) MOTOR GENERATOR...										
(b) MAIN MOTOR										
WORKSHOP MOTOR	1	1	.01	7	.044	24	42	300	V.C.	L.C.A.B.
VENTILATING FANS										
E.R. AUXYS. S.B. FEED:-	4	1	.0225	7	.064	66.2	75	40	V.C.	L.C.A.B.
SUPPLY:- FILTER	1	1	.01	7	.044	25.1	42	210	V.C.	L.C.A.B.
LUB. OIL PURIFIER	1	1	.01	7	.044	25.1	42	270	V.C.	L.C.A.B.
FUEL OIL PURIFIER	1	1	.0045	7	.029	12	18.2	340	V.I.R.	L.C.A.B.
GALLEY BLOWER	1	1	.0045	7	.029	12	18.2	340	V.I.R.	L.C.A.B.
SECTION B.D. FEED:-	2	1	.01	7	.044	24.2	42	50	V.C.	L.C.A.B.
SUPPLY:- CRANK CASE FAN	1	1	.0045	7	.029	12.7	18.2	260	V.I.R.	L.C.A.B.
PRIMING PUMP	1	1	.0045	7	.029	12.7	18.2	260	V.I.R.	L.C.A.B.

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.

FOR FURNISHING SHIPBUILDING CO. LTD.

*W. Rogers*, Electrical Engineers.

Date 2-3-39.

#### COMPASSES.

Minimum distance between electric generators or motors and standard compass 210 feet

Minimum distance between electric generators or motors and steering compass 204 feet

The nearest cables to the compasses are as follows:—

A cable carrying 1/4 Ampères on the feet from standard compass 1/2 feet from steering compass.

A cable carrying 1/4 Ampères 1/2 feet from standard compass on the feet from steering compass.

A cable carrying 1/4 Ampères 1/2 feet from standard compass on the 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 FURNISHING SHIPBUILDING CO. LTD.

*J. M. Goverley*, DIRECTOR

Builder's Signature.

Date 2-3-39.

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 installed under special survey. The materials used and the workmanship are good. On completion the equipment was run under working conditions, the governor gear of the generating sets were operated and the overload and reversed current trip mechanisms of the circuit breakers were adjusted and tested. The insulation resistances of all circuits was measured and the spare gear was verified. This installation is in my opinion suitable for a classed vessel carrying petroleum in bulk.

The vessel is equipped with an echo sounding device and direction finding apparatus.

*W. H. L. J.*  
6/3/39.

Total Capacity of Generators 68 Kilowatts.

The amount of Fee ... £ 29 : 6 : 0 When applied for, at Mch. 1939

Travelling Expenses (if any) £ : : 1 : 4 : 39 3/4 When received, 19 39 3/4

*G. Hunter*

Surveyor to Lloyd's Register of Shipping.

Committee's Minute

TUE 7 MAR 1939

Assigned

See FE mach. rpt.



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