

# REPORT ON ELECTRICAL EQUIPMENT.

(OTHER THAN FOR THE PROPULSION OF THE VESSEL)

Date of writing Report 24<sup>th</sup> Sept., 1938 When handed in at Local Office 10 Port of Hull Received at London Office 24<sup>th</sup> Sept. 1938

No. in Survey held at Harrington Hill on 2nd Dec Date, First Survey 9<sup>th</sup> April, Last Survey 19<sup>th</sup> Sept., 1938  
Reg. Book. Suppl. (Number of Visits 12)  
89965 on the M.V. "SAN DELFINO"

Tons { Gross 8072.04  
Net 4770.63

Built at Harrington Hill on 2nd Dec By whom built Furness S.B. Co. Ltd. Yard No. 283 When built 1938

Owners Esso Oil & Shipping Co. Ltd. Port belonging to London

Electric Light Installation fitted by Furness S.B. Co. Ltd. Elec. Dept. Contract No. 283 When fitted 1938

Is the Vessel fitted for carrying Petroleum in bulk Yes

System of Distribution Double wire

Pressure 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 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 No, 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, Certs. herewith

Have certificates for generators under 100 kw. been supplied and approved Manufacturers' test certs. herewith

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 Engine room starboard side, 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 Engine room starboard side near 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 — 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

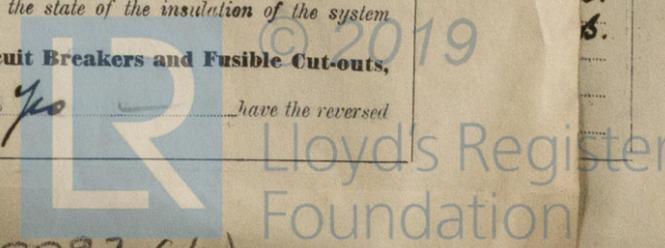
Main Switchgear, description of switchgear for each generator and each outgoing circuit, and arrangement of equalizer switches Double pole circuit breakers with overload tripping mechanisms on generator mains, double pole change over switches and double pole fuses on outgoing circuits.

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 Yes

Instruments on main switchboard Two ammeters Two 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 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 & Twin* 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 *Yes* 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 *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 laid under machines or floorplates *No* 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*

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* L.C.A.B. cables clipped to surface in machinery spaces and run on tank cleats along underside of fore and aft gangway. L.C.A.B. cables under deck

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 *Lead*

Earthing Connections, state what earthing connections are fitted and their respective sectional areas *Yes* 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* are they ventilated 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 *Artic' gaslight fittings mounted in steel casing with glazed apertures in gaslight screwed tubing and in L.C.A.B. cable along fore and aft gangway, where are the controlling switches situated in machinery accommodation on sub-switchboard.*

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 *None fitted* whether fixed or portable *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* 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 *None fitted* have certificates for all motors for essential services been supplied and approved *Yes, Certs. furnished* 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 fitted 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	1	16	110	145.5	650	Single cyl. steam engine		
AUXILIARY	1	16	110	145.5	650	Four cyl. diesel engine	Fuel Oil	Above 150° F.
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.	In Circuit.	Rule.				
MAIN GENERATOR	1	.1	19	.083	145.5	191	70	V.C.	L.C.A.B.	
SHORT CIRCUIT CONNECTIONS	1	.1	19	.083	145.5	191	200	V.C.	L.C.A.B.	
AUXILIARY GENERATOR	1	.1	19	.083	145.5	191	80	V.C.	L.C.A.B.	
EMERGENCY GENERATOR										
ROTARY TRANSFORMER MOTOR GENERATOR										
ENGINE ROOM L.T.A. S.B. FEED	1	.0225	7	.064	37.9, 9.10	75	18.2	30	V.C.	L.C.A.B.
BOILER ROOM	1	.0045	7	.029	2.2	11	4		V.I.R.	L.C.A.B.
AUXILIARY SWITCHBOARDS										
SUB-SWITCHBOARD FEED	1	.3	37	.103	97	88	370	V.C.	L.C.A.B.	
SUPPLY WIRELESS	1	.0225	7	.064	15.2	15	90	V.C.	L.C.A.B.	
STBD. ACCOM. D.B.	1	.0045	7	.029	18.2	18.2	25	V.I.R.	L.C.A.B.	
NAV. LODGE D.B.	1	.007	7	.026	14.1	14.1	45+20	V.I.R.	L.C.A.B.	
FORW. ACCOM. D.B.	1	.0225	7	.064	19.1	19.1	310	V.I.R.	L.C.A.B.	
CARGO CONN. D.B.	1	.0045	7	.029	2.2	11	4		V.I.R.	L.C.A.B.
PROPULSION D.B.	1	.0045	7	.029	2.2	11	4		V.I.R.	L.C.A.B.
PUMP ROOM L.T.A. D.B.	1	.0045	7	.029	2.2	11	4		V.I.R.	L.C.A.B.
ACCOMMODATION										
RET. ACCOM. S.B. FEED	1	.06	19	.064	68.8	185	95	V.C.	L.C.A.B.	
SUPPLY ENGR. PART D.B.	1	.01	7	.044	11	11.6	30	V.I.R.	L.C.A.B.	
ENGR. STBD. D.B.	1	.0045	7	.029	11.3	11.3	80	V.I.R.	L.C.A.B.	
ENGR. PORT D.B.	1	.0045	7	.029	11.3	11.3	85	V.I.R.	L.C.A.B.	
CARGO STBD. D.B.	1	.0045	7	.029	11.3	11.3	20	V.I.R.	L.C.A.B.	
CARGO CONN. D.B.	1	.0045	7	.029	11.3	11.3	20	V.I.R.	L.C.A.B.	
WIRELESS										
SEARCHLIGHT										
MASTHEAD LIGHT	1	.002	3	.029	36	7.8	282 + 584	V.I.R.	L.C.A.B.	
SIDE LIGHTS	1	.002	3	.029	36	7.8	80	V.I.R.	L.C.A.B. in pipe	
COMPASS LIGHTS	1	.002	3	.029	36	7.8	40	V.I.R.	L.C.A.B.	
STEAM LIGHTS	1	.002	3	.029	36	7.8	600	V.I.R.	L.C.A.B.	
CARGO LIGHTS										
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										
ENGINE ROOM S.B. FEED	1	2	.1	19	.083	63.8	191	200	V.C.	L.C.A.B.
SUPPLY VENT. FANS	1	1	.007	7	.036	10.7	24	70	V.I.R.	L.C.A.B.
OIL FUEL TRANSFER	1	1	.0045	7	.029	17	18.2	30	V.I.R.	L.C.A.B.
DRILL	1	1	.01	7	.029	17	18.2	50	V.I.R.	L.C.A.B.
GALLEY BLOWER	1	1	.002	3	.029	3.9	7.8	200	V.I.R.	L.C.A.B.
FUEL OIL SERVICE PUMP	1	1	.003	3	.026	9.08	12	110	V.I.R.	L.C.A.B.
STEAM RAINING FUEL PUMP	1	1	.002	3	.029	3	7.8	120	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.

P.S. Glover per *WP* Electrical Engineers. Date 4-10-38

COMPASSES.

Minimum distance between electric generators or motors and standard compass 288 feet  
 Minimum distance between electric generators or motors and steering compass 284 feet  
 The nearest cables to the compasses are as follows:—  
 A cable carrying .14 Ampères on the feet from standard compass 12 feet from steering compass.  
 A cable carrying .14 Ampères 12 feet from standard compass on the 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 *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 TANKERS SHIPBUILDING CO. LIMITED,*  
*Jas. M. Robertson* Builder's Signature. Date 4-10-38  
*Secretary.*

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 under special survey. The materials used and the workmanship are good. On completion the equipment was run under working conditions, the dynamo engine governors were operated, the overload trip mechanisms of the circuit breakers were adjusted and tested, the main switch-board, sub-switchboard, section and distribution boards, switches, fuses, cables, motors and fittings were examined and tested, the insulation resistance of all circuits and apparatus was measured and the spare gear was checked. This equipment can, in my opinion, be considered suitable for a classed vessel carrying petroleum in bulk. Direction finding equipment is fitted.*)

Total Capacity of Generators *32* Kilowatts.

The amount of Fee ... £ *23* : — :  
 Travelling Expenses (if any) £ : :  
 When applied for, 19...  
 When received, *1/12 19 38*  
*JMR 2/12*

*B. Harrison*  
 Surveyor to Lloyd's Register of Shipping.

Committee's Minute *TUE 18 OCT 1938*  
 Assigned *See minute on P. machinery*

2m. 12.36.—Transfer. The Surveyors are requested not to write on or below the space for Committee's Minute.