

# REPORT ON ELECTRICAL EQUIPMENT.

(OTHER THAN FOR THE PROPULSION OF THE VESSEL)

Received at London Office... APR 10 1941

Date of writing Report... 19-3-1941 When handed in at Local Office... 19... Port of... Liverpool

No. in Survey held at... Birkenhead Date, First Survey... 13/12/40 Last Survey... 21/3/1941  
 Reg. Book. (Number of Visits... 11)

88020 on the M.V. "EMPIRE STEEL" Tons {Gross... 8138  
 Net... 4774

Built at... Birkenhead By whom built... Cammell Laird & Co. Ltd. Yard No... 1053 When built... 1941

Owners... Ministry of Shipping. Port belonging to... Liverpool London

Electrical Installation fitted by... The Sunderland Forge & Eng. Co. Ltd. Contract No... 1053 When fitted... 1941

Is vessel fitted for carrying Petroleum in bulk... Yes Is vessel equipped with D.F... Yes E.S.D... — Gy.C... — Sub.Sig... —

Have plans been submitted and approved... Yes System of Distribution... Two wires Voltage of supply for Lighting... 110

Heating... — Power... 110 Direct or Alternating Current, Lighting... DC Power... DC If Alternating Current state periodicity... — Prime Movers,

has the governing been tested and found as per Rule when full load is suddenly thrown on and off... Yes Are turbine emergency governors fitted with a trip switch as per Rule... — Generators, are they compound wound... Yes, are they level compounded under working conditions... Yes, if not compound wound state distance between generators... — and from switchboard... — Where more than one generator is fitted are they arranged to run in parallel... No, are shunt field regulators provided... Yes Is the compound winding connected to the negative or positive pole... Negative Have machines over 100 kw. been inspected by the Surveyors during manufacture and testing... — Have certificates of test for machines under 100 kw. been supplied... Yes and the results found as per rule... Yes Are the lubricating arrangements and the construction of the generators as per rule... Yes Position of Generators... In main engine room on special platform. is the ventilation in way of generators satisfactory... Yes are they clear of inflammable material... Yes, if situated near unprotected combustible material state distance from same horizontally... — and vertically... —, are the generators protected from mechanical injury and damage from water, steam and oil... Yes, are the bedplates and frames earthed... Yes and the prime movers and generators in metallic contact... Yes Switchboards, where are main switchboards placed... In engine room adjacent to generator are they in accessible positions, free from inflammable gases and acid fumes... Yes, are they protected from mechanical injury and damage from water, steam and oil... Yes, if situated near unprotected combustible material state distance from same horizontally... — and vertically... —, what insulation material is used for the panels... Shidamyo. if of synthetic insulating material is it an Approved Type... Yes if of semi-insulating material (slate or marble) are all conducting parts insulated therefrom as per Rule... — Is the frame effectually earthed... Yes Is the construction as per Rule... Yes, including accessibility of parts... Yes, absence of fuses on the back of the board... Yes, individual fuses to pilot and earth lamps, voltmeters, etc... Yes locking of screws and nuts... Yes, labelling of apparatus and fuses... Yes, fuses on the "dead" side of switches... Yes Description of Main Switchgear for each generator and arrangement of equaliser switches... Double-pole switch fuses for each generator. and for each outgoing circuit... Double pole switch fuses.

Are compartments containing switchboards composed of fire-resisting material or lined as per Rule... Yes Instruments on main switchboard... 2 ammeters... 2 voltmeters... — synchronising devices. For compound machines in parallel is the ammeter connected on the pole opposite to the equaliser connection... — Earth Testing, state means provided... Good Lamps. Switches, Circuit Breakers and Fuses, are they as per Rule... Yes, are the fuses an approved type... Yes, are all fuses labelled as per Rule... Yes If circuit breakers are provided for the generators, at what overload current did they open when tested... —, are the reversed current protection devices connected on the pole opposite to the equaliser connection... —, have they been tested under working conditions, and at what current did they operate... — Joint Boxes, Section Boards and Distribution Boards, is the construction and position as per Rule... Yes Cables, are they insulated and protected as per the appropriate Tables of the Rules... Yes, if otherwise than as per Rule are they of an approved type... —, state maximum fall of pressure between bus bars and any point under maximum load... 4.39 V, are the ends of all cables having a sectional area of 0.04 square inch and above provided with soldering sockets... Yes Are paper insulated and varnished cambric insulated cables sealed at the ends... Yes.

with insulating compound — or waterproof insulating tape Yes. Are all the cable runs in accessible positions, not exposed to drip or accumulation of water or oil, high temperatures or 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, etc., lead covered Yes or run in conduit —. State how the cables are supported and protected. Main cables L.C.A. run in pipes on fore-cast gangway. Machinery spaces L.C.A. clipped to beam or deck to stowhook. Accommodation lead covered clipped to structure of vessel.

Are all lead sheaths, armouring and conduits effectually bonded and earthed Yes. Refrigerated chambers, are the cables and fittings as per Rule Yes.

Are all cables passing through decks and watertight bulkheads provided with deck tubes or watertight glands Yes, where unarmoured cables pass through beams, etc., are the holes effectually bushed Yes and with what material Lead. Alternative Lighting, are the groups of lights in the engine and boiler rooms arranged as per Rule Yes. Emergency Supply, state position None and method of control —.

Navigation Lamps, are they separately wired Yes controlled by separate double pole switches Yes and fuses Yes. Are the switches and fuses in a position accessible only to the officers on watch Yes, is an automatic indicator fitted Yes. Secondary Batteries, are they constructed and fitted as per Rule Yes, are they adequately ventilated Yes what is the battery capacity in ampere hours 80 ah. (Batteries for telephones).

Fittings, are all fittings on weather decks, in stowholds and engine rooms and wherever exposed to drip or condensed moisture, weatherproof Yes. Are fittings installed where readily combustible materials or inflammable or explosive dust or gases are likely to be present Yes, if so, how are they protected Sp of Pump Room - Casercastle space. Flameproof fittings.

and where are the controlling switches fitted in accommodation, are all fittings suitably ventilated Yes, are all fittings and accessories constructed and installed as per Rule Yes. Searchlight Lamps, No. of —, whether fixed or portable —, are their fittings as per Rule —. Heating and Cooking, is the general construction as per Rule —, are the frames effectually earthed —, are heaters in the accommodation of the convection type —. Motors, are all motors constructed and installed as per Rule Yes and placed in well-ventilated compartments in which inflammable gases cannot accumulate and free from damage from water, steam and oil Yes, if situated near unprotected combustible material state minimum distance from same horizontally — and vertically —. Are motors coupled to oil fuel transfer and unit pressure pumps capable of being stopped from a position accessible in the event of fire in the pump compartment —. Have motors of 100 BHP and over been inspected by the Surveyors during manufacture and testing —. Have certificates of test for motors under 100 BHP intended for essential services been supplied and the results found as per Rule Yes. Control Gear and Resistances, are they constructed and fitted as per Rule Yes. Lightning Conductors, where required are they fitted as per Rule Yes. Ships carrying Oil having a Flash Point less than 150° F. Have all the special requirements of the Rules for such ships been complied with Yes, are all fuses of the cartridge type Yes are they of an approved type Yes. Are the fittings for pump rooms, tween deck spaces, etc., in accordance with the special requirements for such ships Yes. Are the cables lead covered as per Rule Yes. Spare Gear, if the vessel is for open sea service have spares been provided as per Rule Yes, are they suitably stored in dry situations Yes. Insulation Tests, has the insulation resistance of all circuits and apparatus been tested and found satisfactory 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	20	110	182	600	Steam Engines		
EMERGENCY								
ROTARY TRANSFORMER								

GENERATOR CABLES.

DESCRIPTION.	KILOWATTS.	CONDUCTORS.		MAXIMUM CURRENT IN AMPERES.		APPROX. LENGTH (lead plus return feet).	INSULATED WITH.	HOW PROTECTED.
		No. in Parallel Per Pole.	Sectional Area or No. and Dia. of Strands. Sq. Ins. or sq. mm.	In the Circuit.	Rule.			
MAIN GENERATOR	20	1	19/083	182	191	60	V.C.	L.C.A.
" " EQUALISER								
EMERGENCY GENERATOR								
ROTARY TRANSFORMER: MOTOR								
" " GENERATOR								

MAIN DISTRIBUTION CABLES.

DESCRIPTION.	CONDUCTORS.		MAXIMUM CURRENT IN AMPERES.		APPROX. LENGTH (lead plus return feet).	INSULATED WITH.	HOW PROTECTED.
	No. in Parallel Per Pole.	Sectional Area or No. and Dia. of Strands. Sq. Ins. or sq. mm.	In the Circuit.	Rule.			
AUX. SWITCHBOARDS AND SECTION BOARDS							
FORWARD SECTION PANEL S1. (MAIN)	1	19/083	63.5	191	765	V.C.	L.C.A. in pipe
" " " (ALTERNATIVE)	1	19/083	52.5	191	630	V.C.	" "
AFT. SECTION PANEL S2	1	19/083	96.9	191	60	V.C.	L.C.A.
ENGINE ROOM LIGHTING SECTION BOX S3	1	7/064	56	75	40	V.C.	"
" " MACHINERY " " S4	1	19/083	112	191	100	V.C.	"
ENGINE ROOM LIGHTING, D.B. PART S3 D1	1	7/036	14	24	20	Rubber	L.C.A.
" " S3 D2	1	7/036	14	24	40	"	"
STAR S3 D3	1	7/036	14	24	100	"	"
" " S3 D4	1	7/036	14	24	120	"	"

LIGHTING AND HEATING, ETC., CABLES.

WIRELESS	1	7/064	36	75	90	V.C.	L.C.
NAVIGATION LIGHTS D.B. S1 D1	1	7/036	2.5	24	90	Rubber	L.C.
LIGHTING AND HEATING CARGO LIGHTING D.B. S2 D7	1	7/036	6.5	24	21	"	"
FORECASTLE LIGHTING D.B. S1 D8	1	7/064	6.4	75	300	V.C.	L.C.A. in pipe
CARGO LIGHTING, D.B. S1 D7	1	7/036	13.6	24	45	Rubber	L.C.
MIDSHIP " PART D.B. S1 D6	1	7/036	22.4	24	60	"	"
" " STAR D.B. S1 D5	1	7/036	23.8	24	12	"	"
" " UPPER BRIDGE D.B. S1 D4	1	7/036	12.6	24	85	"	"
" " " D.B. S1 D3	1	7/036	10	24	75	"	"
NAVIGATION BRIDGE D.B. S1 D2	1	7/036	9.1	24	90	"	"
POOP DECK LIGHTING D.B. S2 D1	1	7/036	9.2	24	90	"	"
" " " S2 D2	1	7/036	2.2	24	144	"	"
" " " S2 D3	1	7/036	15.1	24	40	"	"
" " " S2 D4	1	7/036	7.0	24	144	"	"
UPPER DECK (AFT) LIGHTING D.B. S2 D5	1	7/036	21.9	24	96	"	"
" " " S2 D6	1	7/036	9.6	24	60	"	"
" " " S2 D7	1	7/036	20.3	24	96	"	"
" " " S2 D8	1	7/036	9.8	24	60	"	"

MOTOR CABLES.

ALL IMPORTANT MOTORS TO BE ENUMERATED.	No.	B.H.P.						
TURNING MOTOR	1	10	1	19/083	90	191	200	V.C. L.C.A.
LUB. OIL PURIFIERS	2	2	1	7/036	17.8	24	80	Rubber L.C.A.
FUEL OIL PURIFIER	1	2	1	7/036	17.8	24	80	" "
LATHE MOTOR	1	1.5	1	7/036	15	24	60	" "
DRILLING MACHINE MOTOR	1	2	1	7/036	18	24	50	" "
GRINDER MOTOR	1	3	1	7/064	26	75	80	V.C. "
VENTILATING FAN AFT	1	3	1	7/064	26	75	105	" L.C.
" " MIDSHIP	1	3	1	7/064	26	75	90	" "

The Electrical Equipment is installed in accordance with the approved plans and the requirements of the Rules.  
 All Insulated Conductors are guaranteed to have been tested at the maker's works as specified in the Rules.  
 The foregoing is a correct description.

F. PRO THE SUNDERLAND TRADE & ENGINEERING CO. LTD.

*J. Williamson*

Electrical Engineers.

Date 20. 3. 41.

COMPASSES.

Minimum distance between electric generators or motors and standard compass 3HP Ventilating Fan below - 38ft

Minimum distance between electric generators or motors and steering compass 2HP Ventilating Fan below - 36ft

The nearest cables to the compasses are as follows:—

A cable carrying 0.36 Ampères 9 feet from standard compass 5 feet from steering compass.

A cable carrying 0.36 Ampères 10 feet from standard compass 6 feet from steering compass.

A cable carrying 2.5 Ampères 8 feet from standard compass 6 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 1/2 degrees on my course in the case of the

standard compass, and 1/2 degrees on FOR course in the case of the steering compass.

ON BEHALF OF  
 THE SUNDERLAND TRADE & ENGINEERING CO. LIMITED,  
 GAMMA

*[Signature]*

Builder's Signature.

Date 20. 3. 41.

SECRETARY

Is this installation a duplicate of a previous case No If so, state name of vessel —

Plans. Are approved plans forwarded herewith No If not, state date of approval 3rd October 1940

Certificates. Are certificates of test for motors engaged on essential services and generators forwarded herewith Yes

General Remarks (State quality of workmanship, whether insulation tests, etc., have been made, opinions as to class, etc.) The electrical

equipment of this vessel has been fitted on board under special survey, and in accordance with the approved plans, tested under full working conditions & found satisfactory. The materials & workmanship are good.

*Notice*  
*J.Y.*  
*18/4/41*

Total Capacity of Generators 40. Kilowatts.

The amount of Fee ... £ 25 : 0 : 0

When applied for, 31 MAR 1941

Travelling Expenses (if any) £ : : When received. ....19....

*[Signature]*

Surveyor to the Register of Shipping.

Committee's Minute LIVERPOOL 8 APR 1941

Assigned See Minute or Y.C. Machinery Report. *Y.C.P.*

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 (The Surveyors are requested not to write on or below the space for Committee's Minute.)



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