

# REPORT ON ELECTRIC FITTINGS.

(OTHER THAN FOR THE PROPULSION OF THE VESSEL)

Received at London Office.....

Date of writing Report 4. 2. 35 When handed in at Local Office 9. 2. 1935 Port of GLASGOW

No. in Survey held at GLASGOW. Date, First Survey 17. 8. 34 Last Survey 6. 2. 1935  
(Number of Visits...16.....)

Book. 177 on the T.S.M.V. "WAIRANGI" Tons { Gross 10779  
Net 6538

Built at GLASGOW By whom built HARLAND & WOLFF LD. Yard No. 9249 When built 1934

Ships SHAN SAVILL & ALBION CO. LTD Port belonging to SOUTHAMPTON.

Electric Light Installation fitted by HARLAND & WOLFF LTD Contract No. 9249 When fitted 1934

Is the Vessel fitted for carrying Petroleum in bulk No.

System of Distribution TWO 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 rating 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 ✓

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 Nº1 & Nº2 STARº Nº3 & Nº4 PORT ENGINE ROOM LOWER DECK. ✓, are they clear of all inflammable material YES ✓

is the ventilation in way of the generators satisfactory YES. ✓, are they clear of all inflammable material YES ✓

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 AFT UPPER DK

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 mica or micanite or other non-hygroscopic insulating material, and the slab similarly insulated from its framework — if semi-insulating material is used, are all conducting parts insulated from the slab FABRICATED METAL MICANITE INSULATED. ✓

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. ✓, proportion of omnibus YES ✓

individual fuses to voltmeter, pilot or earth lamp YES ✓, connections of switches YES ✓

Main Switchgear, description of switchgear for each generator and each outgoing circuit, and arrangement of equalizer switches D.P. 1500 AMP CIRCUIT BREAKERS WITH 1/2 & R.C. TRIPS WITH TIME LAGS. — WITH TRIPLE POLE SWITCH — 1 FOR EACH POLE & 1 FOR EQUALISER

are they provided by insulated bar for each generator — D.P. SWITCH & D.P. FUSES ON EACH OUTGOING CIRCUIT & CIRCUIT BREAKERS ON AIR COMPRESSOR & 4 MASTERBOARDS.

instruments on main switchboard 4 ammeters 2 voltmeters — synchronising device for paralleling purposes.

Earth Testing, state what means are provided at the main switchboard for indicating the state of the insulation of the system 2 LAMPS IN SERIES ACROSS BUS BARS MID POINT EARTHED. ✓

Switches, Circuit Breakers and Fusible Cut-outs, do these comply with the requirements of the Rules YES ✓

Joint Boxes Section and Distribution Boards, is the construction, protection, insulation, material, and position of these as per rule YES ✓



W1158-0202 1/2

**SINGLE-TWIN**

**Cables:** Single, twin, concentric, or multicore & multicore, are the cables insulated and protected as per Tables IV or V of the Rules **YES**.

**Fall of Pressure,** state maximum between bus bars and any point of the installation under maximum load **4.2 Volts**

**Cable Sockets and other connections,** are the ends of all cables having a sectional area of 0.04 square inch and above provided with soldering sockets **YES**.

**Paper Insulated Cables,** If cables are paper covered, is the dielectric at the exposed ends of the conductor protected from moisture by being suitably sealed with insulating compound

**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**.

**Support and Protection of Cables,** state how the cables are supported and protected **H.R. CABLE IN ACCOM. CLIPPED DIRECT TO BULKHEAD WITH BRASS CLIPS. H.R. CABLE ON FORWARD DECK IN GALVANISED STEEL TROUGHING FILLED WITH COMPOUND. & H.R. CABLES IN PIPES TO WINCHES. H.R. CABLES IN ENGINE ROOM ON GALV PERFORATED PLATE. I.S.A.B FOR LITS IN ENGINE RM GRABINGS & TWEEN DECK**

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,** if lights are fitted, are the cables and fittings in accordance with the special requirements **YES**.

**Joints in Cables,** state if any, and how made, insulated, and protected **ANY JOINTS ARE MADE IN SPECIAL JOINT BOXES BY MEANS OF BRASS CLAMPED SLEEVES.**

**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 **AUXILIARY** supply and how the generator is driven **AUXILIARY GENERATOR ROOM - FORWARD ENGINE RM: SHELTER DECK. 1 COMP WOUND GENERATOR - DIESEL DRIVEN. WITH SWITCHBOARD CONTROLLED BY D.P. SWITCH & D.P. FUSES - D.P. SWITCHES & D.P. FUSES TO EACH OUTGOING CIRCUIT - INTERCONNECTED TO MAIN SWITCHBOARD**

**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**.

**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: IRON ROD GUARDS**

**FITTED OVER LIGHTS AND FIXED TO DECK - LAMPS CAN BE REMOVED AND LAMPHOLDER PROTECTED WITH METAL PLUG.** are any fittings placed in spaces where inflammable or explosive dust or gases are liable to be present, if so, how are they protected **NO**.

how are the cables led —

where are the controlling switches situated —

**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 — and —

**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 —

**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 —

If portable lamps for use in dangerous spaces are supplied, are they of a type approved by the Home Office —

**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 ...	4	300	220	1350	340	6cyl DIESEL ENGINE	BRITISH PETROL	NOT LESS THAN 150° F. CLOSE TEST
AUXILIARY ...	1	25	220	114	775	3cyl D°	ANGLO PERSIAN	NOT LESS THAN 194° F. CLOSE TEST (PENNY MARTIN)
EMERGENCY ...								
ROTARY TRANSFORMER								

**GENERATOR, LIGHTING AND HEATING CONDUCTORS.**

DESCRIPTION.	No. per Pole.	CONDUCTORS.		COMPOSITION OF STRAND.		TOTAL MAXIMUM CURRENT. AMPERES.		Approximate Length. (Lead and Return.) Feet.	Insulated with	HOW PROTECTED.
		Total Effective Area per Pole Sq. Ins.	No.	Diameter.	In Circuit.	Rule.				
MAIN CABLES FOR MAIN GENERATOR ...	3	2.25	91	.103	1350	1383	210	H.R.	SHEET METAL WHERE REQ'D.	
EQUALISER CONNECTIONS ...	2	1.20	91	.093	675	768	105	"	"	
AUXILIARY GENERATOR ...	1	.10	19	.083	114	118	40	"	"	
EMERGENCY GENERATOR ...										
ROTARY TRANSFORMER MOTOR GENERATOR ...										
ENGINE ROOM LIGHTING ...	1	.0145	7	.052	272	37	176	"	"	
BOILER ROOM ...	1	.0145	7	.052	30	37	170	"	"	
AUXILIARY SWITCHBOARD ...	1	.10	19	.083	114	118	40	"	"	
BRANCH WIRING FOR ACCOMMODATION LIGHTING ...	1	.0020	3	.029	3	7.8	60	"	"	
ENGINE ROOM LIGHTING ...	1	.0020	3	.029	3	7.8	60	L.S.A.B.	"	
HEATERS 600W. 750W. 1500W & 2000W ...	1	.0020	3	.029	4.6	7.8	80	H.R.	"	
HEATERS 1500W & 2000W ...	1	.0030	3	.036	9	12	80	"	"	
MAIN CABLES FOR WIRELESS ...	1	.0100	7	.044	30	31	270	H.R.	"	
SEARCHLIGHT ...										
MASTHEAD LIGHT ...	1	.0020	3	.029	.18	7.8	490	L.S.A.B.	"	
SIDE LIGHTS ...	1	.0020	3	.029	.18	7.8	102	"	"	
COMPASS LIGHTS ...	1	.0020	3	.029	.18	7.8	52	H.R.	"	
PROPELLER LIGHTS ...	1	.0020	3	.029	.18	7.8	850	H.R.	"	
CARGO LIGHTS FORWARD ...	1	.0225	7	.064	18	46	434	"	"	
CARGO LIGHTS MID ...	1	.0225	7	.064	18	46	50	"	"	
CARGO LIGHTS AFT ...	1	.0400	19	.052	22.2	64	414	"	"	
HEATERS FORWARD ...	1	.25	37	.093	196.1	214	456	"	"	
HEATERS MID & AFT ...	1	.15	37	.072	138.8	152	260	"	"	

**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 Effective Area per Pole Sq. Ins.	No.	Diameter.	In Circuit.	Rule.			
BALLAST PUMP ...	1	1	.075	19	.072	96	97	200	H.R.	SHEET METAL WHERE REQ'D.
MAIN BILGE LINE PUMPS ...	2	1	.0225	19	.044	50	53	190	"	"
GENERAL SERVICE PUMP ...	1	1	.075	19	.072	96	97	210	"	"
EMERGENCY BILGE PUMP ...										
SANITARY PUMP ...	1	1	.075	19	.072	96	97	230	"	"
CIRC. SEA WATER PUMPS ...	3	1	.075	19	.072	93	97	342	"	"
CIRC. FRESH WATER PUMPS ...	1	1	.040	19	.052	62	64	290	"	"
AIR COMPRESSOR ...	2	1	.600	91	.093	380	384	384	"	"
FRESH WATER PUMP ...	1	1	.040	19	.052	62	64	180	"	"
ENGINE TURNING GEAR ...	2	1	.040	19	.052	60	64	160	"	"
ENGINE REVERSING GEAR ...										
LUBRICATING OIL PUMPS ...	3	1	.120	37	.064	122	130	182	"	"
OIL FUEL TRANSFER PUMP ...										
WINDLASS ...	1	1	.400	61	.093	306	452	56	"	"
WINCHES, FORWARD ...	6	1	.25	37	.093	246	295	82	"	GALV PIPES.
WINCHES, MID ...	5	1	.25	37	.093	246	295	258	"	D°
WINCHES, AFT ...	9	1	.25	37	.093	246	295	176	"	D°
STEERING GEAR—										
(a) MOTOR GENERATOR ...										
(b) MAIN MOTOR ...	2	1	.30	37	.103	230	240	452	"	SHEET METAL WHERE REQ'D.
WORKSHOP MOTORS MANGLES ...	4	1	.0225	7	.064	32	46	140	"	"
VENTILATING FANS ENG. RM. ...	4	1	.0445	7	.029	14	18.2	208	"	"
35" AER. FANS ...	5	1	.0225	7	.064	30	46	80	"	"
D° D° ...	4	1	.0145	7	.052	30	37	74	"	"
SROOCO FANS ...	2	1	.0030	3	.036	7	12	40	"	"
D° ...	1	1	.0145	7	.052	10	37	60	"	"
PROPELLER FANS 18" ...	5	1	.0030	3	.036	3.6	12	266	"	"
D° REFRIG ...	1	1	.0070	7	.036	8	24	102	"	"

All Conductors are of annealed copper conforming to British Standard Specification No. 7.  
 The Insulated Conductors are guaranteed to withstand the immersion and resistance tests specified in the Rules.  
 The foregoing is a correct description.

For HARLAND AND WOLFF, LIMITED,

*R. Green*  
 Govan Secretary.

Electrical Engineers.

Date 4<sup>th</sup> February 1935

COMPASSES.

Distance between electric generators or motors and standard compass 80 FEET.

Distance between electric generators or motors and steering compass 76 "

The nearest cables to the compasses are as follows:—

A cable carrying 18 Ampères LED INTO feet from standard compass LED INTO feet from steering compass.

A cable carrying 20 Ampères 12 feet from standard compass 14 feet from steering compass.

A cable carrying 3 Ampères 12 feet from standard compass 14 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 ANY course in the case of the standard compass, and NIL degrees on ANY course in the case of the steering compass.

For HARLAND AND WOLFF, LIMITED,

*R. Green*  
 Govan Secretary.

Builder's Signature.

Date 4<sup>th</sup> February 1935

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 on board under special survey, tested under full working conditions and found satisfactory. The materials & workmanship were found to be good and sound

*9/2/35*

*W. H. Haffner*  
 15/2/35

Total Capacity of Generators 1225 Kilowatts.

The amount of Fee ... £ 62 : 2 : 4 When applied for, 12 FEB 1935

Travelling Expenses (if any) £ : : 18 : 2 : 35 When received, 19/2

*W. H. Haffner*  
 Surveyor to Lloyd's Register of Shipping.

Committee's Minute GLASGOW 12 FEB 1935 *JRH*

Assigned No record.

Im. 9. 30.—Transfer.  
 (The Surveyors are requested not to write on or between the space for Committee's Minute.)



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