

REPORT ON ELECTRIC FITTINGS.

(OTHER THAN FOR THE PROPULSION OF THE VESSEL) 11 SEP 1934

Date of writing Report 19 When handed in at Local Office 10th Sept 1934 Port of Belfast.No. in Survey held at Belfast. Date, First Survey 5th Jan. Last Survey 28th Aug. 1934
Reg. Book. (Number of Visits.....14)

87481 on the Steel Twin Screw Motor Vessel Wainera

Tons { Gross
Net

Built at Belfast By whom built Harland & Wolff Ltd. Yard No. 922 When built 1934

Owners Shaw, Savill & Albion Co. Ltd. Port belonging to Southampton.

Electric Light Installation fitted by Harland & Wolff Ltd. Contract No. 922 When fitted 1934

Is the Vessel fitted for carrying Petroleum in bulk No.

System of Distribution Two Wire Direct Current System.

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 Main generators in Motor Rm. Port & Starboard. Aux. generator in Aux. Dynamo Rm. Shelter Deck.

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 on Switchboard Platform Aft End of Motor Room.

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, 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

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, proportion of omnibus

bars 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. overload and

reverse current circuit Breaker with time limits and interlocked equalizer switch for

each generator. D.P. circuit Breaker or D.P. Switch & Fuse for outgoing circuits.

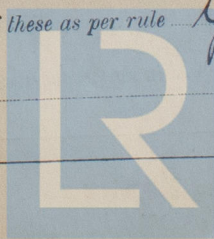
Instruments on main switchboard 4 amperes 2 voltmeters Arranged for paralleling purposes.

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.

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



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Cables: Single, twin, concentric, or multicore Single 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 9.8 (Windless factor)

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 Hard Rubber cables on Perforated Plating and Troughing L.S.A.B. Baranex cables along gratings in Machinery Space under Floor Plates also round large hatches.
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, if lights are fitted, are the cables and fittings in accordance with the special requirements

Joints in Cables, state if any, and how made, insulated, and protected Properly constructed and insulated joint Boxes

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 All Metal Portable Fittings not fitted to Ships Steelwork are earthed with connections equivalent to Working conductor
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 Auxiliary generator direct coupled to Diesel Engine situated in Auxiliary Dynamo Rm. in Shelter Dk. controlled from Auxiliary Switchboard in same room.

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
Cast iron guarded fittings.

are any fittings placed in spaces where inflammable or explosive dust or gases are liable to be present, if so, how are they protected Gas tight
Guarded locked pendants
how are the cables led

Hard Rubber Cable in Galvanised iron conduit.
where are the controlling switches situated Locally.

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

Are 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

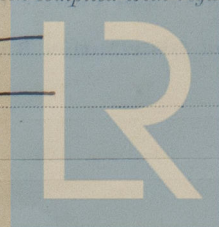
are they protected from mechanical injury and damage from water, steam or oil Yes, are their axes of rotation fore and aft Yes except vertical Motors.
if situated near unprotected woodwork or other combustible material, are the motors of the totally enclosed, pipe ventilated, forced draught, drip or 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 —



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generator, Lighting and Heating conductors (Contd.).

Description	Conductors		Composition of Strand		Total Max. Current		Approx. Length (Lead & Return) Feet.	Insulated with	How Protected.
	No per cable.	Total sq. ft.	No.	Dia.	Inches	Rule.			
Lighting.	1	0.0025	7	.064	34	46	✓		
Master Board A. Heating.	1	0.651	37	.093	190.2	214	✓	Rubber	Hard Rubber.
Looking.	1	0.060	19	.064	28	83	✓	"	
Lighting.	1	0.040	19	.052	43.2	64	✓	"	"
Master Board B. Heating.	1	0.150	37	.072	133.8	152	✓	"	"
Looking.	1	0.060	19	.064	51.4	83	✓	"	"
Master Board C.	2	0.800	61	.093		576	✓	"	"
Master Board D.	1	0.400	61	.093		288	✓	"	"
Master Board E.	2	0.600	37	.103		480	✓	"	"
Master Board F.	3	1.500	61	.103		996	✓	"	"
Master Board G.									
{ Compressors	3	3.00	127	.103		1785	✓	"	"
{ Refig. Board	2	1.00	61	.103		1190	✓	"	"
						664			



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Motors Conductors (Contd.)										
Description	No. of Motors	Conductors per Pole	Total length of conductors in the motor	Composition of strand	Total current in circuit	Max. Amps. Rule	Approximate lead & return feet	Insulated with	How Protected	
Electric Cranes	2	1	0.010	7	.044	24	31	80	Rubber	Hard Rubber
Aux. S.W. Circ. Pump	1	1	0.014	7	.052	34	37	26	"	"
" F.H. " "	1	1	0.010	7	.044	24	31	10	"	"
Purified Fuel Oil Pump	1	1	0.004	7	.029	10	18.2	48	"	"
Fuel Oil Purifier	4	1	0.004	7	.029	10	18.2	48	"	"
Boiler Blower	1	1	0.004	7	.029	10	18.2	140	"	"
Sub. Oil Pump (Turbo Blower)	1	1	0.004	7	.029	10	18.2	180	"	"
Boiler Feed Pump	1	1	0.004	7	.029	10	18.2	160	"	"
Motor Rm. Vent. Fan (1 3/4 HP)	4	1	0.004	7	.029	7	18.2	240	"	"
Pneumator. Air Comp.	1	1	0.002	3	.029	1.5	7	160	"	"
Refrig. Circ. Pump	2	1	0.040	19	.072	96	97	200	"	"
CO ₂ Compressor	3	3	3.0	127	.103	1640	1685	70	"	"
Brine Pump	4	1	0.040	19	.052	64	64	40	"	"
Plunger Brine Pump	1	1	0.025	7	.064	15	46	70	"	"
Workshop Motors										
Spinning Machine	1	1	0.003	3	.036	8	12	48	"	"
Lathe 9 1/2"	1	1	0.004	7	.029	12	18.2	36	"	"
" 6"	1	1	0.003	3	.036	6	12	32	"	"
Drill.	1	1	0.003	3	.036	8	12	32	"	"

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PARTICULARS OF GENERATING PLANT.

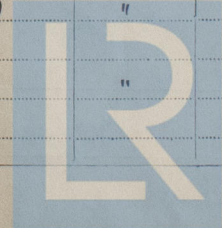
DESCRIPTION OF GENERATOR.	No. of	RATED AT				DRIVEN BY	WHERE DRIVEN BY AN INTERNAL COMBUSTION ENGINE.	
		Kilowatts.	Volts.	Ampères.	Revs. per Min.		Fuel Used.	Flash Point of Fuel.
MAIN ...	4	300	220	1364	270	Diesel Engines		
AUXILIARY ...	1	25	220	113.5	750			
EMERGENCY ...								
ROTARY TRANSFORMER								

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 Effective Area per Pole Sq. Ins.	No.	Diameter.	In Circuit.	Rule.			
MAIN GENERATOR ...	3	2250	91	.103	1363.7	1383	144	Rubber	Hard Rubber.
EQUALISER CONNECTIONS ...	2	1.50	91	.093		768	72	"	"
AUXILIARY GENERATOR ...	1	0.100	19	.083	113.6	118	60	"	"
EMERGENCY GENERATOR									
ROTARY TRANSFORMER MOTOR									
Generator Room	1	0.014	7	.052	30	37	180	"	"
AUXILIARY SWITCHBOARDS ...	1	0.100	19	.093	113.6	118	60	"	"
ACCOMMODATION ...	1	0.0225	7	.064	20.6	46	308	"	"
WIRELESS ...	1	0.01	7	.044		31	240	"	"
SEARCHLIGHT ...									
MASTHEAD LIGHT ...	1	0.002	3	.029	0.18	7.8	600	"	"
SIDE LIGHTS ...	1	0.002	3	.029	0.18	7.8	100	"	"
COMPASS LIGHTS ...	1	0.002	3	.029	0.18	7.8	24	"	"
POOP LIGHTS ...									
CARGO LIGHTS (Aft) ...	1	0.040	19	.052	22	64	420	"	"
Cargo Lights (Fore)	1	0.0025	7	.064	17.8	46	380	"	"
Cargo Lights (amidships)	1	0.0025	7	.064	9	46	200	"	"
Heating	1	0.250	37	.093	196.2	214	390	"	"

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	0.075	19	.072	96	97	150	Rubber	Hard Rubber
MAIN BILGE LINE PUMPS ...	2	1	0.030	19	.044	50	53	130	"	"
GENERAL SERVICE PUMP ...	1	1	0.075	19	.072	96	97	200	"	"
EMERGENCY BILGE PUMP										
SANITARY PUMP ...	1	1	0.075	19	.072	96	97	230	"	"
Circ. SEA WATER PUMPS	3	1	0.075	19	.072	93	97	340	"	"
Circ. FRESH WATER PUMPS	2	1	0.040	19	.052	62	64	160	"	"
AIR COMPRESSOR ...	2	1	0.600	91	.093	380	384	220	"	"
FRESH WATER PUMP ...	1	1	0.014	7	.052	34	37		"	"
ENGINE TURNING GEAR...	2	1	0.040	19	.052	60	64	90	"	"
ENGINE REVERSING GEAR										
LUBRICATING OIL PUMPS ...	3	1	0.120	37	.064	122	130	100	"	"
OIL FUEL TRANSFER PUMP...	2	1	0.007	7	.036	22	24	90	"	"
WINDLASS ...	1	1	0.400	61	.093	308	452	60	"	"
WINCHES, FORWARD (57.B.H.P.)	6	1	0.200	37	.083	228	247	52	"	"
WINCHES, AFT (57.B.H.P.)	9	1	0.200	37	.083	228	247	60	"	"
STEERING GEAR—										
(a) MOTOR GENERATOR...										
(b) MAIN MOTOR ...	2	1	0.300	37	.103	240	240	420	"	"
VENTILATING FANS										
12 1/2" Ineco Fans	2	1	0.003	3	.036	6	12	280	"	"
18" Propeller Fans	5	1	0.003	3	.036	4.5	12	200	"	"
35" Auto Fans	9	1	0.0045	7	.052	30	37	80	"	"
Galley Range Blower	2	1	0.002	3	.029	1.5	7	46	"	"



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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.



Electrical Engineers.

Date *Sept 8th /34*

COMPASSES.

Distance between electric generators or motors and standard compass *156 ft.* *50 ft. to nearest motor.*

Distance between electric generators or motors and steering compass *150 ft.* *44 ft to nearest motor.*

The nearest cables to the compasses are as follows:—

A cable carrying *20* Ampères *16* feet from standard compass *12* feet from steering compass.

A cable carrying *52* Ampères *20* feet from standard compass *16* 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 *all* course in the case of the standard compass, and *nil* degrees on *all* course in the case of the steering compass.



Builder's Signature.

Date.

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 main generators were constructed under Special Survey. The materials & workmanship are good. They were tested at full load & overload and the temperature increases were found to be within the rule requirements. Commutation, high voltage & megger tests were satisfactory. The vessel was wired in accordance with the approved plan and the rules and the megger tests of the switchboards generators & motors were satisfactory. The installation was tried out at moored & sea-trials. In my opinion the vessel is eligible for notation "Electriclight".

*Noted
by
11/9/34.*

Total Capacity of Generators *1225* Kilowatts.

The amount of Fee ... £ *62.2.6* When applied for, *10/9/34*

Travelling Expenses (if any) £ *—* When received, *19.10.34*

Committee's Minute *FRI. 14 SEP 1934*

Assigned *See F.E. Rpt.*

R. Lee Ames.
Surveyor to Lloyd's Register of Shipping.

1m. 9.30.—Transfer.
(The Surveyors are requested not to write on or below the space for Committee's Minute.)



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