

# REPORT ON ELECTRIC FITTINGS.

(OTHER THAN FOR THE PROPULSION OF THE VESSEL) -1 MAY 1929  
Received at London Office.....

Date of writing Report \_\_\_\_\_ When handed in at Local Office \_\_\_\_\_ 19 \_\_\_\_\_ Port of Belfast.

No. in Survey held at Belfast. Date, First Survey 17<sup>th</sup> Jan Last Survey 19<sup>th</sup> Apr 1929  
Reg. Book. \_\_\_\_\_ (Number of Visits..... 12)

on the Steel Twin Screw "HIGHLAND BRIGADE." Tons { Gross 14450.  
Net \_\_\_\_\_

Built at Belfast. By whom built Harland & Wolff, Ltd. Yard No. 812 When built 1928-9.

Owners Nelson Steam Navigation Co. (H.W. Nelson Ltd. Mems) Port belonging to Belfast.

Electric Light Installation fitted by Harland & Wolff Ltd. Contract No. 812 When fitted 1928-9.

System of Distribution Two wire, Direct Current to Distributing Boxes.

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

Position of Generators Main generators in Motor Room, Port & Starboard. Emergency generators in House on Boat 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. Fore 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 Circuit Breaker with reverse current, time limits & interlocked equalizer switches for each generator.

D.P. overload Circuit Breakers or D.P. switches & fuses for each outgoing circuits

Instruments on main switchboard 7 ammeters 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

of Shipping.



**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 10 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 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

**Support and Protection of Cables,** state how the cables are supported and protected? Lead covered cables run on plating in accommodation & in steel troughing filled with bitumastic cement on open decks  
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 yes

**Joints in Cables,** state if any, and how made, insulated, and protected Junction Boxes used for all joints

**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 steelwork of ship are earthed with connection 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 Emergency Dynamo House  
**Boat Deck** - Controlled from Emergency switchboard in same house. Generators direct coupled to Diesel engines

**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 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 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 yes  
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 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 —

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	200	220	910	225	Diesel engines.		
AUXILIARY ...								
EMERGENCY ...	2	50	220	227	400	Diesel engines.		
ROTARY TRANSFORMER								

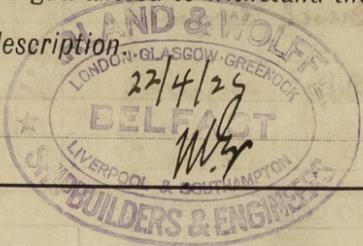
LIGHTING AND HEATING CONDUCTORS.

Ref. No.	DESCRIPTION.	No. of Conductors.	Effective Area of each Conductor. Sq. Ins.	COMPOSITION OF STRAND.		Total Maximum Current. Ampères.	Approximate Length. (Lead and Return.) Feet.	Insulated with	HOW PROTECTED.
				No.	Diameter.				
	MAIN GENERATORS A.F.S. ...	8 3/4 PER POLE	0.6	91	.093"	910	150	Rubber	Lead Covered
	MAIN GENERATORS FOR ...	8 3/4 PER POLE	0.6	91	.093"	910	100	"	" " (equalizer & per pole.)
	EMERGENCY GENERATOR	2	0.3	37	.103"	227	51	"	" "
	" " EQUALIZER	1	0.1	19	.083"	114	25	"	" "
	AUXILIARY SWITCHBOARDS ...	2	0.25	37	.093"	217	750	"	" "
	ENGINE ROOM ...								
	BOILER ROOM ...								
	ACCOMMODATION ...								
	WIRELESS ...	2	0.01	7	0.044	15	780	Rubber	Lead Covered
	SEARCHLIGHT ...								
	MASTHEAD LIGHT ...	2	0.003	3	0.036	0.5	200	Rubber	Lead Covered
	SIDE LIGHTS ...	2	"	"	"	"	55	"	" "
	COMPASS LIGHTS ...	2	"	"	"	"	30	"	" "
	POOP LIGHTS ...								
	CARGO LIGHTS ...	2	0.007	7	0.036	15.5	30	Rubber	Lead Covered
	ARC LAMPS ...								
	HEATERS ...								

MOTOR CONDUCTORS.

Ref. No.	DESCRIPTION.	No. of Motors.	Effective Area of each Conductor. Sq. Ins.	COMPOSITION OF STRAND.		Total Maximum Current. Ampères.	Approximate Length. (Lead and Return.) Feet.	Insulated with	HOW PROTECTED.
				No.	Diameter.				
	BALLAST PUMP ...	1	0.06	19	.064"	77	108	Rubber	Lead Covered
	MAIN BILGE LINE PUMPS ...	2	0.04	19	.052	51	177	"	" "
	GENERAL SERVICE PUMP ...								
	EMERGENCY BILGE PUMP ...	1	0.075	19	.072	88	591	"	" "
	SANITARY PUMP ...	1	0.1	19	.093	111	180	"	" "
	CIRC. SEA WATER PUMPS ...	4	0.12	37	.064	122	110	"	" "
	CIRC. FRESH WATER PUMPS	2	0.06	19	.064	68	330	"	" "
	AIR COMPRESSOR ...								
	FRESH WATER PUMP ...	1	0.007	7	.036	18.5	189	"	" "
	ENGINE TURNING GEAR ...	2	0.04	19	.052	58	300	"	" "
	ENGINE REVERSING GEAR ...								
	LUBRICATING OIL PUMPS ...	4	0.25	37	.093	190	450	"	" "
	OIL FUEL TRANSFER PUMP	2	0.04	19	.052	48	240	"	" "
	WINDLASS ...	1	0.3	37	.103	330	315	"	" "
	WINCHES, <u>12x3</u>	3	0.1	19	.083	130	170	"	" "
	WINCHES, <u>4,5,6,7,8,9</u>	6	0.06	19	.064	94	210	"	" "
	STEERING GEAR	2	0.3	37	.103	230	750	"	" "
	(a) MOTOR GENERATOR ...								
	(b) MAIN MOTOR ...								
	WORKSHOP MOTOR ...	5	0.003	3	.036	10	50	"	" "
	VENTILATING FANS ...	4	0.01	7	.044	28	180	"	" "
	WINCHES 10, 11, 12	3	0.06	19	.064	94	450	"	" "
	" 13, 14, 15	3	0.06	19	.064	94	210	"	" "
	" 16, 17, 18	3	0.06	19	.064	94	570	"	" "
	VENTILATION FANS ...	2	0.04	19	.052	57	210	"	" "
	" "	4	0.003	3	.036	10	120	"	" "

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 22<sup>nd</sup> April 1929

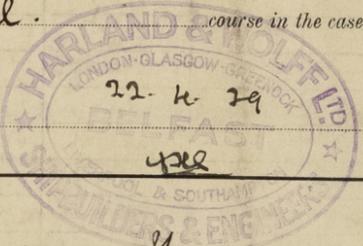
COMPASSES.

Distance between electric generators or motors and standard compass 160 feet to generators. 22 feet to nearest motor.  
 Distance between electric generators or motors and steering compass 156 feet to generators. 18 feet to nearest motor.

The nearest cables to the compasses are as follows:—

A cable carrying 39 Ampères 16 feet from standard compass 14 feet from steering compass.  
 A cable carrying 32 Ampères 16 feet from standard compass 14 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 22-4-29

Is this installation a duplicate of a previous case? *Yes* If so, state name of vessel *Highland Monarch - Highland Chieftain*

General Remarks (State quality of workmanship, opinions as to class, &c.)

*This work has been done under special survey. The materials and workmanship are sound and good. The installation has been tried out under full working conditions with satisfactory results. In my opinion the vessel is eligible for notation "Electric Light"*

It is submitted that this vessel is eligible for THE RECORD. ELEC. LIGHT.

*J.R.M.*  
2.5.29

Total Capacity of Generators 900 Kilowatts.

The amount of Fee ... £ 54- : When applied for, 30<sup>th</sup> April 1929  
 Travelling Expenses (if any) £ : When received, 9.5.29

*Rlec Amess.*  
Surveyor to Lloyd's Register of Shipping.

Committee's Minute TUE 7 MAY 1929

Assigned *Elec Light*

Im.1.27.—Transfer. (The Surveyors are requested not to write on or below the space for Committee's Minute.)

