

# REPORT ON ELECTRICAL EQUIPMENT.

(OTHER THAN FOR THE PROPULSION OF THE VESSEL)

Received at London Office

MAR -8 1938

Date of writing Report

19

When handed in at Local Office

7. 3.

1938

Port of *Belfast*

No. in Survey held at

*Belfast*

Date, First Survey

*25 Aug 1937*

Last Survey

*4/3/38*

19

Reg. Book

*30386* on the *Twin Screw Motor Vessel "Kunster"*

(Number of Visits *24*)

Tons { Gross *4320*  
Net *2220*

Built at *Belfast*

By whom built *Harland & Wolff Ltd.*

Yard No. *996*

When built *1938*

Owners *British & Irish Steam Packet Co. Ltd.*

Port belonging to *Liverpool*

Electric Light Installation fitted by *Harland & Wolff Ltd.*

Contract No. *996*

When fitted *1938*

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 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

*Yes*

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*

Have machines over 100 kw. been inspected by the Surveyors during manufacture and testing

*Yes*

Have certificates for generators under 100 kw. been supplied and approved

*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 Aux. Motor Room - Emerg generator on Deck 2, is the ventilation amidships.*

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 *Aux. Motor Room Forward End*

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

*Yes*

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

ammeter 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

*D.P. O/L. Reverse current Circuit Breaker with time limiter Interlocked equalizer switch for each Gen. & D.P. O/L. Circuit Breaker or S.P. Switch & D.P. Lead Type Fuses for 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

*4*

ammeters

*2*

voltmeters *Arranged* for paralleling purposes. For compound machines is the ammeter connected on the opposite pole to equaliser connection

*Yes*

Earth Testing, state what means are provided at the main switchboard for indicating the state of the insulation of the system

*Earth Lamps connected to Bus bars by D.P. Switch & 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~~ multicore Yes ✓ 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 10 volts (Power) ✓ **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 Hand Rubber Water proof Type

Are cables in machinery spaces, galleys, laundries, bathrooms and lavatories lead covered or run in conduit Hand Rubber Water proof Type ✓ **Support and Protection of Cables,** state how the cables are supported and protected Hand Rubber Water proof Type ✓ **Waterproofing of Cable Trays,** are the cable trays where necessary, except in way of engine room, protected from moisture by being suitably sealed with waterproofing material 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 ✓

**Joints in Cables,** state if any, and how made, insulated, and protected Insulated Junction 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 Framework of Ship, are earthed with conductor equivalent to 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 generator Direct coupled to Diesel Engine, In House Boat Docking Ships, Controlled from switchboard in same House ✓

**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 accessible and exposed positions~~ 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 Guards ✓

are any fittings placed in spaces where inflammable or explosive dust or gases are liable to be present, if so, how are they protected Guarded Stirrups ✓

**Fittings with Screwed Conduit in Painted Battery Rooms** Hard Rubber Cable Run in Conduit ✓, how are the cables led Locally ✓

where are the controlling switches situated Locally ✓

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 1 Signalling** Portable ✓, 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 None Over ✓

have machines of over 100 BHP been inspected by the Surveyors during manufacture and testing 100 B.H.P. ✓ have certificates for all motors for essential services been supplied and approved Yes ✓

**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 filled 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 ✓

DESCRIPTION	No. of Motors	CONDUCTORS		COMPOSITION OF STRAND		TOTAL MAXIMUM CURRENT AMPS.		APPROXIMATE LENGTH LEAD RETURN FEET	INSULATED WITH	HOW PROTECTED
		No. per Pole	TOTAL EFFECT AREA PER POLE SQ. INS.	No.	DIA.	IN CIRCUIT	RULE			
Ventilating Fans 1 1/2 H.P.	2	1	0.002	3	0.029"	5	7.8 ✓	280	Rubber	Hard Rubber
do. do. 1 H.P.	1	1	0.002	3	0.029"	4	7.8 ✓	380	"	"
do. do. 1/2 H.P.	2	1	0.002	3	0.029"	2	7.8 ✓	160	"	"
Pantry Hoist	1	1	0.002	3	0.029"	3	7.8 ✓	100	"	"
Fire & Wash Pumps	1	1	0.04	19	0.052"	52	64 ✓	100	"	"
Oil & Paper Fans	2	1	0.003	3	0.036"	8	12 ✓	180	"	"
Sprinkler Pumps	1	1	0.1	19	0.083"	118	118 ✓	240	"	"
do. Compressor	1	1	0.003	3	0.036"	8	12 ✓	110	"	"
Boiler Heat Blower	1	1	0.0045	4	0.029"	15	18.2 ✓	120	"	"
Fuel Oil Purifiers	2	1	0.0045	4	0.029"	10	18.2 ✓	100	"	"
Refined Fuel Oil Pump	1	1	0.003	3	0.036"	6	12 ✓	30	"	"
Fuel Oil Superheaters	1	1	0.003	3	0.036"	6	12 ✓	30	"	"
Fuel Oil Heaters	1	1	0.0045	4	0.029"	10	18.2 ✓	70	"	"
Boiler Water Pumps	2	1	0.002	3	0.029"	3	7.8 ✓	200	"	"
Boiler Pumps	1	1	0.002	3	0.029"	5	7.8 ✓	60	"	"
Hot Water Pumps	3	1	0.002	3	0.029"	2	7.8 ✓	110	"	"
Hot Water Circ. Pump	1	1	0.003	3	0.036"	10	12 ✓	80	"	"
Emergency Air Compressor	1	1	0.0045	4	0.029"	12	18.2 ✓	200	"	"

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 ...	3	175	220	795	300	Diesel engine		
AUXILIARY ...								
EMERGENCY ...	1	15	220	68	1000	Diesel engine		
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.	Circuit.	Rule.			
MAIN GENERATOR ...	2	1.5	91	0.103"	795	922	50	Rubber	Hard Rubber
EQUALISER CONNECTIONS ...	1	0.75	91	0.103"		461	25	"	"
AUXILIARY GENERATOR ...									
EMERGENCY GENERATOR ...	1	0.06	19	0.064"	68	83	50	"	"
ROTARY TRANSFORMER MOTOR ...	1	0.0145	7	0.052"	21.7	37	120	"	"
ROTARY TRANSFORMER GENERATOR ...	1	0.0145	7	0.052"	23.3	37	30	"	"
ENGINE ROOM Lighting ...	1	0.007	7	0.036"	10	24	20	"	"
BOILER ROOM Lighting ...	1	0.007	7	0.036"	20	24	200	"	"
AUXILIARY SWITCHBOARDS ...									
Emergency Switchboard ...	1	0.15	37	0.072"	126	152	120	"	"
6.6d. "F" Motor Room ...	2	1.5	91	0.103"	855	922	100	"	"
ACCOMMODATION ...									
6.6d. "A" & "B" Reference ...	1	0.75	91	0.103"	597	774 (1/2 HR)	490	"	"
6.6d. "B" 2nd ad. ...	1	0.25	37	0.093"	200	214	200	"	"
6.6d. "C" 2nd Ref. (Lower) ...	1	0.2	37	0.083"	165	184	280	"	"
6.6d. "C" 2nd ad. (Cooking) ...	1	0.5	61	0.103"	330	332	280	"	"
6.6d. "C" & "D" Reference ...	1	0.75	91	0.103"	665	774 (1/2 HR)	500	"	"
WIRELESS ...	1	0.007	7	0.036"	18	24	120	P.I.R.	Lead
SEARCHLIGHT ...	1	0.002	3	0.029"	4	7.8	80	"	"
MASTHEAD LIGHT ...	1	0.002	3	0.029"	0.18	7.8	500	Rubber	Hard Rubber
SIDE LIGHTS ...	1	0.002	3	0.029"	0.18	7.8	80	P.I.R.	Lead
COMPASS LIGHTS ...	1	0.002	3	0.029"	0.09	7.8	30	"	"
STERN LIGHTS ...	1	0.002	3	0.029"	0.18	7.8	950	Rubber	Hard Rubber
PORT LIGHTS ...	1	0.007	7	0.036"	4.8	24	350	"	"
CARGO LIGHTS ...	1	0.007	7	0.036"	4.8	24	640	"	"
HEATERS ...	1	0.002	3	0.029"	4.6	7.8	80	"	"

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 ...	1	1	0.04"	19	0.052"	56	64	60	Rubber	Hard Rubber
MAIN BILGE LINE PUMPS ...	1	1	0.0145"	7	0.052"	32	37	60	"	"
GENERAL SERVICE PUMP ...										
EMERGENCY BILGE PUMP ...	1	1	0.03"	19	0.044"	48	53	200	"	"
SANITARY PUMP ...										
CIRC. SEA WATER PUMPS ...	2	1	0.1	19	0.083"	96	118	160	"	"
CIRC. FRESH WATER PUMPS ...	2	1	0.0225	7	0.064"	36	46	240	"	"
AIR COMPRESSOR ...	2	1	0.5	61	0.103"	392	422 (1 HR)	120	"	"
FRESH WATER PUMP ...	2	1	0.0045	7	0.029"	16	18.2	180	"	"
ENGINE TURNING GEAR ...	2	1	0.0225	7	0.064"	40	46	300	"	"
ENGINE REVERSING GEAR ...										
LUBRICATING OIL PUMPS ...	2	1	0.3	37	0.103"	220	240	320	"	"
OIL FUEL TRANSFER PUMP ...	1	1	0.0045	7	0.029"	11	18.2	52	"	"
WINDLASS ...	1	1	0.5	61	0.103"	465	534 (1/2 HR)	60	"	"
WINCHES, FORWARD ...	2	1	0.06	19	0.064"	87	92 (1/2 HR)	200	"	"
Boat Winch ...	1	1	0.0225	7	0.064"	40	46	200	"	"
WINCHES, AFT ...	1	1	0.06	19	0.064"	87	92 (1/2 HR)	100	"	"
Capstans, Aft ...	2	1	0.4	61	0.093"	380	452 (1/2 HR)	160	"	"
STEERING GEAR - Bow Motor ...	1	1	0.0145	7	0.052"	36	37	400	"	"
(a) MOTOR GENERATOR ...										
(b) MAIN MOTOR ...	2	1	0.04	19	0.052"	64	64	640	"	"
WORKSHOP MOTOR ...	2	1	0.002	3	0.029"	5	7.8	60	"	"
VENTILATING FANS 9 1/2 H.P. ...	1	1	0.0225	7	0.064"	38	46	290	"	"
" 7 1/2 " ...	2	1	0.01	7	0.044"	30	31	180	"	"
" 6 3/4 " ...	1	1	0.01	7	0.044"	27	31	360	"	"
" 5 " ...	2	1	0.007	7	0.036"	20	24	400	"	"
" 4 " ...	2	1	0.0045	7	0.029"	16	18.2	150	"	"
" 2 1/4 " ...	1	1	0.003	3	0.036"	9	12	160	"	"
" 1 1/2 " ...	1	1	0.003	3	0.036"	6	12	160	"	"

Note: All cables in vicinity of Navigating Bridge & Wireless Room are P.I.R. Lead covered.

W 456-0093 (313)

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Lloyd's Register Foundation

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



Electrical Engineers.

Date 25<sup>th</sup> February 1938

#### COMPASSES.

Minimum distance between electric generators or motors and standard compass 60'-0" To generators; 45'-0" To Maston.

Minimum distance between electric generators or motors and steering compass 56'-0" " ; 41'-0" " "

The nearest cables to the compasses are as follows:—

A cable carrying 0.09 Amperes on feet from standard compass — feet from steering compass.

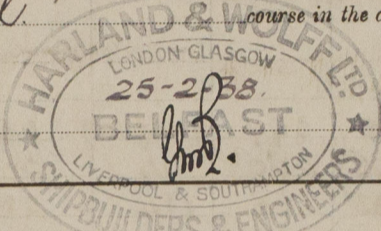
A cable carrying 0.09 Amperes — feet from standard compass on feet from steering compass.

A cable carrying 31 Amperes 10 feet from standard compass 8 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 25<sup>th</sup> Feb 1938

Is this installation a duplicate of a previous case Yes. If so, state name of vessel M.V. LEINSTER.

General Remarks (State quality of workmanship, opinions as to class, &c. This installation has been fitted

on board under special survey and in accordance with the approved plans and has been tested under full working conditions and found satisfactory. The materials and workmanship have been found to be good and sound. The horn lighting in the saloon has been installed in conformity with the Tentative Rules for Luminous Discharge Tubes.

Noted

10.3.38.

Total Capacity of Generators 540 Kilowatts.

The amount of Fee ... £ 58 : 10 : 7. 3. 1938  
Belfast £29.5.0  
Liverpool £29.5.0  
Travelling Expenses (if any) £ : : 24/3. 1938

R.C. Clayton, Charles G. Hunter  
Surveyor to Lloyd's Register of Shipping.

Committee's Minute. FRI 11 MAR 1938

Assigned See other I.B. report